WHAT IS CLAIMED IS:

1. A valve-driving system which is applied to an internal combustion engine having a plurality of cylinders for driving an intake or exhaust valve provided in each cylinder, comprising a plurality of valve-driving apparatuses, each of which is provided for at least each one of the intake valve and the exhaust valve, wherein each valve-driving apparatus comprises:

an electrical motor as a driving source for generating rotation motion; and

a power transmission mechanism for converting the rotation motion of the electric motor into opening and closing motion of the valve to be driven and for transmitting the opening and closing motion to the valve through a cam or a link.

2. The valve-driving system according to claim 1, wherein each cylinder is independently provided with the valve-driving apparatus.

3. The valve-driving system according to claim 1, wherein the intake valve and the exhaust valve of each cylinder are respectively provided with the valve-driving apparatuses independently.

4. The valve-driving system according to claim 1, wherein the power transmission mechanism converts the rotation motion of the electric motor into the opening and closing motion utilizing the cam.

5. The valve-driving system according to claim 4, wherein the valve-driving apparatus further comprises a valve-characteristics adjusting mechanism which changes a correlation between a phase of the cam and at least one of a lift amount and an operation angle of the valve.

6. The valve-driving system according to claim 4, wherein the valve-driving apparatus further comprises a torque fluctuation suppressing mechanism which suppresses fluctuation in torque which is applied to the cam from the valve side.

7. The valve-driving system according to claim 6, wherein the torque fluctuation suppressing mechanism applies a reaction torque to a rotation member provided in a motion transmitting path extending from the electric motor to the cam, so that the reaction torque cancels the fluctuation of a torque which is applied to the cam.

8. The valve-driving system according to claim 7, wherein the torque fluctuation suppressing mechanism includes a cam surface provided on an outer periphery of the rotation member, a lifter opposed to the cam surface, and a spring device which biases the lifter against the cam surface, and wherein a contour of the cam surface of the rotation member is set such that a contact position between the lifter and the cam surface is most retracted toward a center of the rotation member in its radial

direction at a position where a lift amount of the valve by the cam becomes maximum.

9. The valve-driving system according to claim 6, wherein a rotation shaft of the cam is provided with a shaft supporting section which rotatably fits to a cam supporting bearing, and wherein a factor which affects a friction resistance generated in a contact range between the shaft supporting section and the bearing is set unevenly with respect to a circumferential direction of the rotation shaft of the cam, so that the shaft supporting section and the bearing function as the torque fluctuation suppressing mechanism.

10. The valve-driving system according to claim 9, wherein as the factor, a width of the contact range with respect to an axial direction of the rotation shaft of the cam is set unevenly.

11. The valve-driving system according to claim 10, wherein a portion at which the friction resistance is increased is located on opposite side from a nose section of the cam with a rotation center of the rotation shaft of the cam interposed therebetween.

12. The valve-driving system according to claim 4, wherein the rotation shaft of the cam is provided with a balance adjusting device which cancels an unbalance of rotation mass concerning a rotation center of the rotation shaft provided by the cam.

13. The valve-driving system according to claim 12, wherein the rotation shaft of the cam is provided, as the balance adjusting device, with a deleting section which reduces the mass of the rotation shaft at a position closer to the nose section of the cam than the rotation center.

14. The valve-driving system according to claim 13, wherein a hole which is deviated closer to the nose section than the rotation center of the rotation shaft of the cam is formed as the deleting section, and the hole is utilized as an oil-supply hole to the cam.

15. The valve-driving system according to claim 4, wherein an entire periphery of a contour of the cam comprises a projecting curve surface.

16. The valve-driving system according to claim 4, wherein the rotation shaft of the cam is provided with one of a permanent magnet and an electromagnetic coil, the other one of the permanent magnet and the electromagnetic coil is provided around the rotation shaft, and the rotation shaft of the cam is utilized as a rotation shaft of the electric motor.

17. The valve-driving system according to claim 1, wherein the power transmission mechanism converts the rotation motion of the electric motor into the opening and closing motion utilizing the link.

18. The valve-driving system according to claim 17, wherein the power transmission mechanism includes a rotation member which is rotated by the electric motor, and a link section which is rotatably connected to the rotation member at a position deviated from the rotation center of the rotation member, and which is also turnably connected to the valve.

19. The valve-driving system according to claim 18, wherein the link section includes a first link which is rotatably connected to the rotation member, and a second link which is slidably connected to the first link within a predetermined limited range and which is also turnably connected to the valve.

20. The valve-driving system according to claim 17, wherein the power transmission mechanism includes a rotation member which is rotated by the electric motor, a first link which is rotatably connected to the rotation member at a position deviated from the rotation center of the rotation member, a second link which is rotatably connected to the first link and the valve, and a position adjusting device which changes a position of connection point between the first link and the second link.

21. The valve-driving system according to claim 1, wherein the electric motor of any one of the plurality of valve-driving apparatuses is utilized as a driving source of an air pressure adjusting pump.

22. The valve-driving system according to claim 21, wherein the electric motor which drives the valve of the cylinder which is disposed on the outermost side in the arrangement direction of the cylinders is utilized as the driving source of the air pressure adjusting pump.

23. The valve-driving system according to claim 21, wherein the pump is provided as a device which generates a negative pressure for a brake booster of a vehicle.

24. The valve-driving system according to claim 1, wherein at least a portion of the electric motor is exposed from an external upper surface of a head cover of the internal combustion engine.

25. The valve-driving system according to claim 24, wherein the electric motor is taken out from the head cover of the internal combustion engine and is disposed on an upper surface of the head cover.

26. The valve-driving system according to claim 24, wherein the internal combustion engine is mounted in the vehicle in a state that the arrangement direction of the plurality of cylinders coincides with the lateral direction of the vehicle, and that a cylinder head is located forward of a crank chamber.

27. The valve-driving system according to claim 1, further

comprising a cooling device which cools the electric motor.

28. The valve-driving system according to claim 27, wherein a cooling water passage is provided around the electric motor, and the cooling water passage is included in a portion of a circulation path of cooling water in the internal combustion engine, thereby constituting the cooling device.

29. The valve-driving system according to claim 28, wherein the cooling water passage disposed around the electric motor is disposed between a cooling water outlet of a radiator for heat radiation and a cooling water inlet of the internal combustion engine.

30. The valve-driving system according to claim 27, further comprising a fan provided on the rotation shaft of the electric motor as the cooling device.

31. The valve-driving system according to claim 24, wherein a connector of the electric motor is exposed from an upper portion of the head cover of the internal combustion engine, the valve-driving system further comprises a wiring member having a common substrate on which individual terminals, an aggregation terminal and an electric wiring are formed, in which each of the individual terminals is to be connected to each connector, the aggregation terminal is to be connected to a predetermined motor control circuit, and the electric wiring connects these

terminals, and the wiring member is provided on the head cover such as to electrically connect each individual terminal and the connector.